The GIS Approach to FAA Airspace Planning

Jerry Clark
Jet Propulsion Laboratory
California Institute of Technology
4800 Oak Grove Drive
Pasadena, CA 91109
(818) 354-3969
(818) 393-6962 fax
jerry.clark@iplmail.jpl.nasa.gov

Ed Scofield
Washington Air Route Traffic Control Center
Federal Aviation Administration
825 East Market Street
Leesburg, VA
(703) 771-3436

Bill Talbott
Seattle Air Route Traffic Control Center
Federal Aviation Administration
3101 Auburn Way South
Auburn, WA
(206) 351-3543

ABSTRACT

The Federal Aviation Administration (FAA) has been field-testing the prototype of a workstation that staff members will be using when a new air traffic control system becomes operational later this decade. The Macintosh-environment workstation, called the GRaphics Adaptation Support Position engineering model (GRASP/EM), has GIS (geographic information system), RDBMS (relational database management system), word processing and other graphics capabilities. The GRASP/EM has been a proof-of-concept means for converting present-day, manually-oriented functions to computer-assisted data access, manipulation, display, and transfer. The future air traffic control system will be deployed at each of about two dozen Air Route Traffic Control Centers (ARTCC) around the country and will require that numerous text and graphics products be maintained in electronic form and available to controllers for use at their control position as electronic or physical products. But before the new system goes on-line, FAA staff, such as airspace-and-procedures specialists at the Seattle and Washington ARTCCS, have used the GRASP/EM to create products for airspace planning purposes. Airspace is defined as the physical space through which aircraft fly and has geographical and altitude limits that are legally described in text and depicted in graphics. Air traffic controllers are required to guide aircraft

through their airspace based on a thorough understanding of the legal description and graphical representation of the airspace. To facilitate that requirement, airspace-and-procedures specialists define airspace with the controller, and public safety, in mind. Those with access to the GRASP/EM have used the GIS for interactive modeling of changes to airspace, based on their locally-built database. This database includes airways, navigational aids, airspace boundaries, and annotations organized on numerous layers. As a product is required, appropriate layers are accessed and edited to the level of customization needed. The nationally-supplied tabular data are entered manually from printouts or by using RDBMS applications to access electronic data and reformat it for display and editing with the GIS. Examples of their airspace planning applications include defining the boundaries of air traffic control sectors or defining the paths of airways to assure that aircraft are protected from nearby obstructions or the flow of other air traffic, The GIS also has been used for designing protected airspace needed for approaches to airports or for special use airspace needed for training by military aircraft. In each case, the GIS was used to verify coordinates of boundaries or airways, and to depict the airspace in a graphical form. The past two years of trial experience with the GRASP/EM has helped FAA management to refine their understanding of how the operational, commercially-supplied GRASP will be part of the flow of products assisting controllers.